Introduction

In mid 2000, the Federal Highway Administration (FHWA) requested the assistance of the California Department of Transportation (Caltrans) in determining cross-border freight processing times, and in collecting information leading to the potential improvements of the international movement of freight and goods at the Otay Mesa Port of Entry (POE).

A similar freight delay analysis was conducted by Langille Aroostook Engineering Group (LAEG) at the Ferry Point Crossing spanning Calais, Maine and St. Stephen, New Brunswick, Canada.

Location Background

Caltrans efforts were focused at the Otay Mesa Commercial POE at the border of the United States (U.S.) and Mexico. The Otay Mesa POE handles all commercial truck traffic entering the metropolitan areas of San Diego, California from the western portion of the State of Baja California, Mexico.

The Otay Mesa POE is located approximately 13 miles from the downtown San Diego area, and is served by a highway network which includes Interstate 5, I-805, and State Route 905. SR-905 is currently an incomplete state freeway facility, with Otay Mesa Road serving as the missing portion (See Figure 1).

The estimated cost of this six-lane freeway with a wide median for the ultimate six-lane, plus two HOV-lane freeway is $264 million (year 2000 dollars). So far, $217.5 million of the total $264 million has been identified, which is enough to cover environmental, design, right-of-way and a portion of the construction costs. There is currently a $46.5 million shortfall.

Goods Movement in the Region

In addition to the typical agricultural and other perishable commercial traffic crossing the international border, the Maquiladora (twin-plant) industry which involves the San Diego and Tijuana regions has led to a dramatic increase in the cross-border movement of goods, materials, and finished consumables. Across the U.S./Mexico border, the Otay Mesa POE processes the third highest dollar volume of exports and imports, and handles two-thirds of all commercial truck traffic across the entire California/Mexico border. The 1999 totals for trucks crossing at Otay Mesa were over 1.2 million (northbound and southbound). This is projected to increase to 2.9 million trucks within 20 years.

FIGURE 1
San Diego County & Port of Entry Location Map

Because of limited commercial facilities in both seaports and airports in the San Diego/Tijuana region, the majority of all commercial goods are transported by truck over the State highway network.

Purpose

The goal of the survey was to calculate the total processing and delay time for commercial vehicles entering and exiting the U.S. at the Otay Mesa POE during weekday hours. Additionally, processing times at specific inspection points in the Federal Compound and a breakdown of vehicle classifications at the Otay Mesa POE are provided.

Scope of Work

Caltrans gathered data in responding to the request by the FHWA. The data collection methodology included clipboard-based, handwritten entries of the observed data. The goal was to collect a sample size of 40 percent of the daily truck volume, but in actuality a sample size of over 75 percent was obtained.

Data was collected during two separate peak seasons. July 2000 was chosen because of the agricultural influence, and September 2000 selected due to the increase in holiday related manufactured goods entering the U.S. in anticipation of the Christmas season. However our data analysis revealed a minimal seasonal variation and generally a consistent traffic flow throughout the year.

The data collection and analysis was successfully completed in the U.S. However, the original Scope of Work relating to field surveys for cross border time delays of commercial vehicles on the Mexican side was amended due to the reasons noted below. The FHWA was notified regarding Scope of Work amendments prior to the actual implementation of the study.

Caltrans field observations in Mexico were to be carried out on three conditions:

1) Permission to work in Mexico from the Mexican authorities is granted (normally done locally);
2) Permission from Caltrans to work out of the State is granted (normally requires four weeks advance notice), and;
3) In order to perform work in Mexico, both conditions need to be met prior to the actual event.

At the time of initial communications with FHWA regarding this study and after preliminary consultations with Mexican Customs, a tentative approval was considered to allow Caltrans perform "road-side" observations within the Mexican compound of the Otay Mesa POE. On that basis, Caltrans submitted the "final" Scope of Work to FHWA, which included work to be performed in the Mexican facility.

However, as Caltrans got closer to implementing the survey, the administration of Mexico's Otay Mesa POE, was left vacant for a period of time. Mexican personnel left in charge had no authority to issue formal approvals to Caltrans with sufficient advance time for Caltrans to request out of state travel authority. Caltrans notified FHWA of the unexpected situation and requested agreement to perform "visual observations" of the Mexican facility be performed from the US side. FHWA agreed with Caltrans on the impossibility of performing field observations within the Mexican POE and allowed Caltrans to amend the Study as proposed.

Findings and Summary

Otay Mesa POE Operations

Caltrans-District 11 conducted the surveys at the Otay Mesa POE. The survey was conducted over a total of eight days in two different seasons. Four single-day counts were conducted both northbound (import) and southbound (export). The survey days were:

Wednesday, July 19 (northbound) and Thursday, July 20, 2000 (southbound)
Wednesday, July 26 (northbound) and Thursday, July 27, 2000 (southbound)

Wednesday, Sept. 20 (northbound) and Thursday, Sept. 21, 2000 (southbound)
Wednesday, Sept. 27 (northbound) and Thursday, Sept. 28, 2000 (southbound)

Specific days of the week were selected to maximize data collection from Maquiladora (industrial) outputs.

The northbound commercial Otay Mesa POE is open Monday through Friday from 6:00 a.m. to 8:00 p.m. From 6:00 a.m. to 8:00 a.m., only empty commercial vehicles are processed. From 8:00 a.m. to 5:30 p.m., both empty and loaded trucks are allowed entrance into the U.S. Bulk goods and other specialized types of cargo are allowed entrance until 4:30 p.m. From 6:00 p.m. to 8:00 p.m. only empty commercial vehicles are allowed into the POE for processing.

Saturday and Sunday are open for processing from 9:00 a.m. to 5:00 p.m. for empty vehicles, with loaded trucks being processed from 11:00 a.m. to 3:00 p.m.

The average daily traffic for northbound commercial vehicles is estimated at 2,500 to 3,000 vehicles.

The southbound Otay Mesa commercial POE is open Monday through Friday from 9:00 a.m. to 6:00 p.m. for loaded commercial vehicles. Empty commercial vehicles are processed through the southbound passenger facility, which is open from 6:00 a.m. to 10:00 p.m. The southbound export facility is open on Saturday and Sunday from 9:00 a.m. to 11:00 a.m. On Tuesdays through Thursdays, the southbound POE facility handles the import of commercial vehicles transporting hazardous materials from 7:00 a.m. to 8:00 a.m.

Data collection times at the Otay Mesa POE were 6:00 a.m. to 5:30 p.m., for northbound days, and 9:00 a.m. to 5:00 p.m. for southbound days.

Northbound (Import) Traffic

In the U.S. there are seven northbound primary inspection booths. During the days that the data collection efforts were being conducted, the number of open booths fluctuated throughout the day.

In Mexico, the queue length for vehicles waiting to enter the U.S. can exceed one mile in length. The line forms on the Mexican side along Avenida Internacional which runs parallel to the international border. Prior to entering the Mexican facility, there are overhead signs indicating which lanes process loaded and unloaded commercial vehicles. The Mexican export facility typically operates between two and four northbound booths. There is generally coordination between the number of booths open in Mexico and the number open in the U.S. In Mexico, approximately five percent of the export vehicles are sent to secondary inspection, before leaving the Mexican export compound.

Data was collected at various points in the U.S. and Mexico, with the U.S. vehicle license plate serving as identifiers. These points are referred to as Stations (See Table 1 and Figure 2). Northbound vehicle classification percentages are shown in Figure 3.

Station M-1 is the beginning of the queue in Mexico.

Station M-2 is the entrance to the Federal Export Compound in Mexico.

Station M-3 is the arrival point at the Primary Inspection Booth in Mexico.

Station M-4 is the departure point at the Primary Inspection Booth in Mexico.

Station U-1 is the arrival point of U.S. Primary Inspection Booth.

Station U-2 is the departure point of the U.S. Primary Inspection Booth.

Once the primary inspection was completed at Station U-1/U-2, the driver was either directed to the secondary station (approximately 16 percent), or was told to proceed to the exit booths. Trucks sent to the secondary inspection were directed to the dock area or to the x-ray machines. The inspections at this location are carried out based on the commodity, paperwork type, and inspection type. Trucks sent to the exit booths were either randomly stopped for canine inspections or proceeded directly to the exit booths.

Station U-3 is the U.S. Exit Booth.

Table 1
Average Northbound Processing and Delay Times

Location	Average Processing and Delay
Station M-1 to Station M-2	One hour
Station M-2 to Station M-3	20 minutes
Station M-3 to Station M-4	50 seconds
Station M-4 to Station U-1	15 minutes
Station U-1 to Station U-2	80 seconds
Station U-2 to U-3 (with secondary)	Two hours, 42 minutes
Station U-2 to U-3 (no secondary)	25 seconds
Total Processing Time M-1 to U-3 (no U.S. secondary)	One hour, 38 minutes
Total Processing Time M-1 to U-3 (with U.S. secondary, but no Mexico secondary inspection)	Four hours, 19 minutes
Overall Total Processing Time (no Mexico secondary inspection)	Two hours, 3 minutes

FIGURE 2
Otay Mesa
Commercial Port of Entry
Northbound Truck Circulation

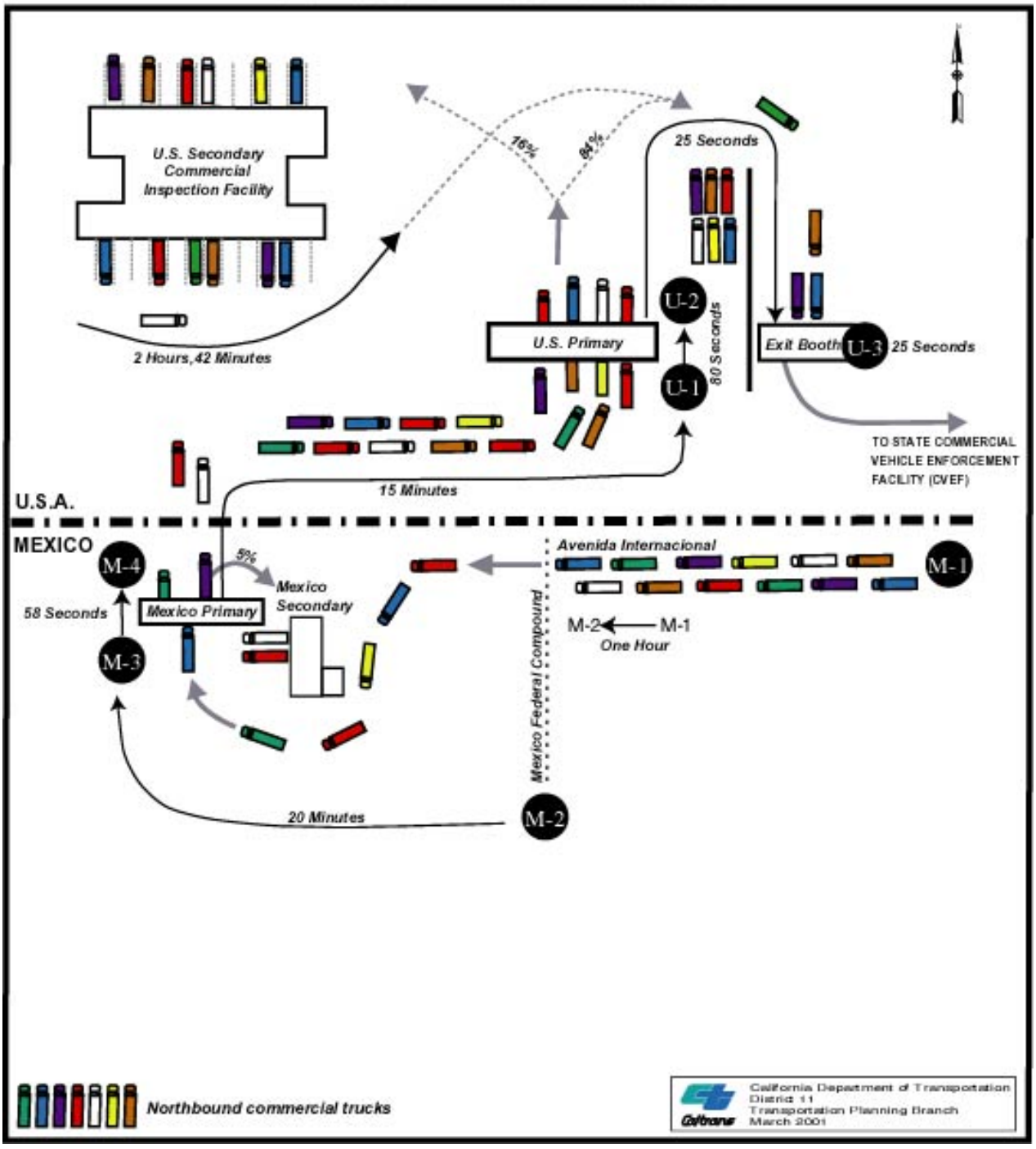
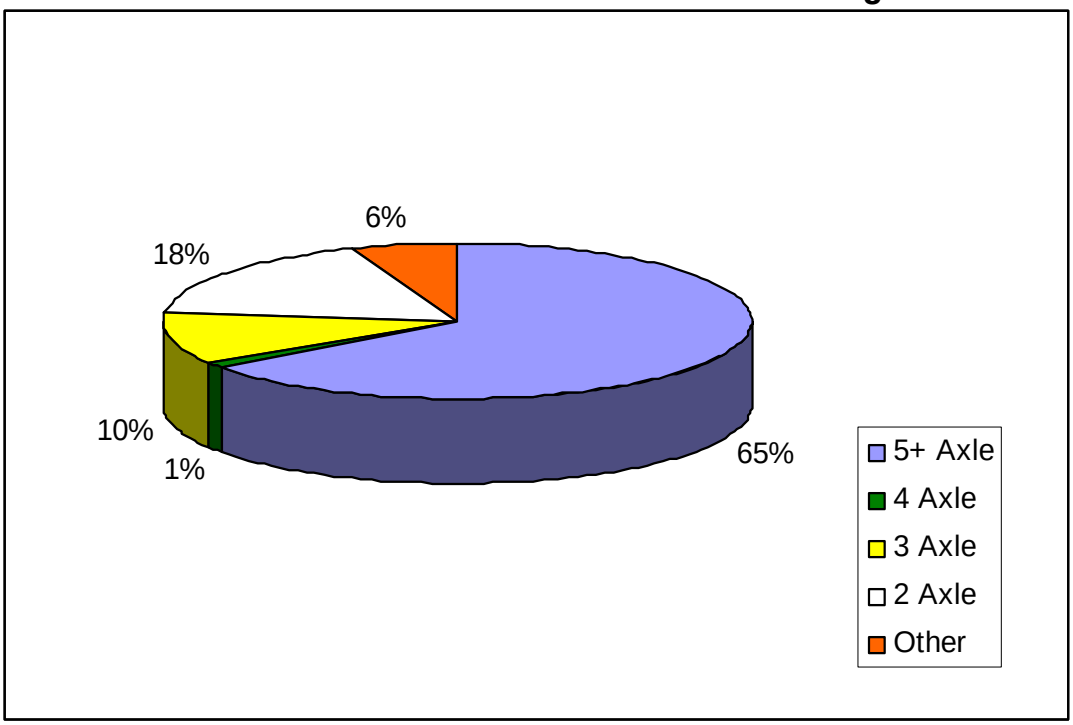


Figure 3
Northbound Vehicle Classification Percentages



Southbound (Export) Traffic

As with the northbound traffic, various points were referenced with U.S. vehicle license plates serving as the means of tracking the vehicle through the stages of processing (See Table 2 and Figure 4).

In the U.S., data was collected at the beginning of the southbound queue (located on a truck-only access route), inside the facility, and visual observations were made of processing times at the Mexican primary processing booths.

Once inside the U.S. export facility, trucks were processed at one of two available booths, then allowed entry to Mexico for primary processing and possible secondary inspection. Most trucks proceeded directly to the U.S. export booths, with the exception of tanker trucks which proceeded through the facility to the weigh station.

Southbound empty commercial vehicles were processed through the Otay Mesa passenger auto facility and do not utilize the commercial vehicle inspection facility.

Station U-1 represents the beginning point of the southbound queue.

Station U-2 represents the entry point to the U.S. export facility.

Station U-3 represents the arrival point of the U.S. Export Booth.

Station U-4 represents the departure point of the U.S. Export Booth.

Station M-1 is the arrival point Mexico Primary Import Booth.

Station M-2 is the departure point of Mexico Primary Import Booth.

The average daily traffic for southbound commercial vehicles is estimated at 2,500 to 3,000, with approximately 50 percent of these commercial vehicles (empty trucks) utilizing the southbound passenger auto facility. A sample size of more than 1,400 commercial vehicles for each southbound collection day was recorded. The vehicle classification percentages are shown in Figure 5.

Table 2
Average Southbound Processing and Delay Times

Location	Average Processing and Delay
Station U-1 to Station U-2	One hour
Station U-2 to Station U-3	25 seconds
Station U-3 to Station U-4	17 seconds
Station U-4 to Station M-1	One minute, 30 seconds
Station M-1 to M-2	One minute
Overall Total Processing Time Station U-1 to M-2	One hour, three minutes

FIGURE 4
Otay Mesa
Commercial Port of Entry
Southbound Truck Circulation

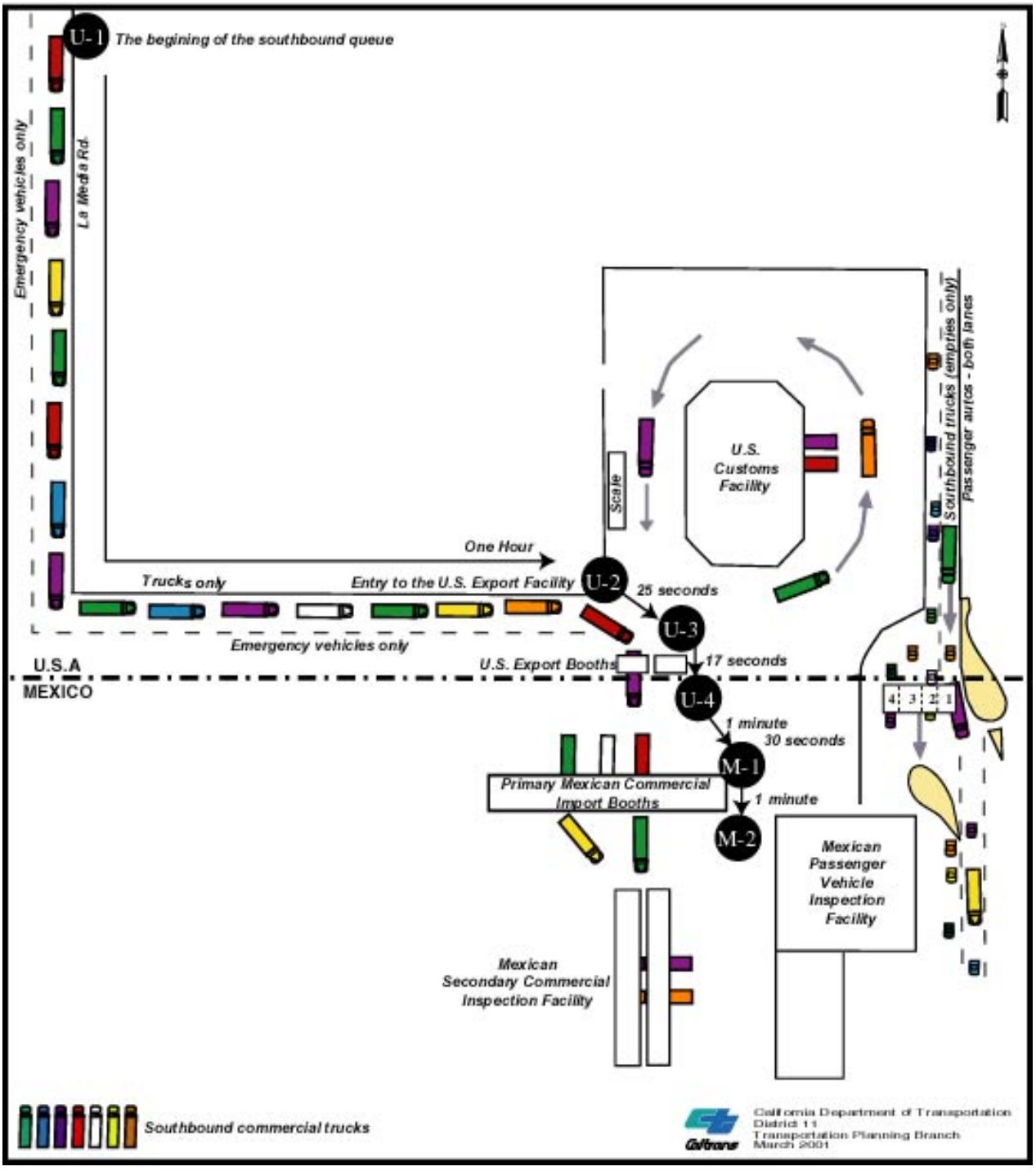


Figure 5
Southbound Vehicle Classification Percentages